



WISCONSIN

FOREST SERVICE RESEARCH AND DEVELOPMENT

STATE FUNDING HISTORY	Enacted FY 2003 (\$)	Enacted FY 2004 (\$)	Pres. Budg. FY 2005 (\$)
RHINELANDER			
NC-4152 Physiology of Growth/Mult. Stress	1,318,000	1,299,000	1,329,000
NC-4153 Principles of Landscape Ecology	1,045,000	1,030,000	1,038,000
NC-4158 Sustainable Intensive Forestry	733,000	662,000	677,000
WISCONSIN TOTAL	3,096,000	2,991,000	3,044,000

RESEARCH & DEVELOPMENT, a division of the USDA Forest Service (FS R&D), strives to be the "go to" organization for information and solutions to sustain forests and rangelands and the values they provide people. FS R&D has the flexibility to address today's issues effectively and to respond to tomorrow's needs. Among the world's leaders in forest conservation research, scientists contribute to the stewardship of land, real property and society by providing research results that help create jobs and affordable homes, and improve the health of trees, forests and forest ecosystems. Innovative research products permit the Forest Service and other public and private land managers to monitor and manage forest responses to environmental change, contributing significantly to the sustainability of the nation's forests and rangelands and improving human health.

FS R&D operates six research stations, the Forest Products Laboratory, and the International Institute of Tropical Forestry located in Puerto Rico. It employs over 500 scientists and hundreds of

technical and support personnel at 67 field sites throughout the nation. The FY 2005 President's Budget includes \$280,654,000 for Forest and Rangeland Research.

The **North Central Research Station**, headquartered in St. Paul, Minnesota, currently has research and development programs in six Midwestern states (Illinois, Indiana, Minnesota, Missouri, Michigan, and Wisconsin). The FY 2005 President's Budget is \$22,200,000, an increase of \$1,308,000 above FY 2004.

RHINELANDER

NC-4152, Physiological Mechanisms of Growth and Multiple- Stress Responses in Northern Forest Trees. Unit scientists examine how trees respond to stress caused by climate change, air pollution, or naturally occurring forest stressors, such as insects and disease. By understanding how trees grow, scientists are able to provide insights into how future forests will grow under a changing climate and how that will influence the sustainability of the region's forest economy.

Information essential to any policy measures which might provide economic incentives for carbon storage in forests is also provided.

<http://www.ncrs.fs.fed.us/4152/>

NC-4153, Principles of Landscape Ecology for Managing Temperate Forests. Unit scientists develop information on the consequences of land use fragmentation on the supply of goods and services. Using this information, scientists are identifying trends in land use change in the region and determining where "hot spots" of intensive change are likely to occur. This information on the relationship between changes in the landscape and the ecological consequences of those changes is critical to effective land stewardship and wise growth strategies for local and regional communities. This unit also develops analytical tools that provide policymakers and land managers with a common language to describe and analyze landscapes. <http://www.ncrs.fs.fed.us/4153/>

NC-4158, Genetic and Silvicultural Systems for Sustainable Intensive Forestry. This unit develops fast-growing, short-rotation, woody crops, focusing on hybrid poplars that produce wood 5 to 7 times faster than natural forests. To enhance the usefulness of these hybrids, unit scientists produce new clones adapted for a wider range of sites, develop plantation establishment practices, and increase understanding of insect, disease, and other problems that limit establishment, growth, and carbon sequestration by short-rotation woody crops. These crops provide agricultural communities with alternative crops and farm income, while providing feedstock for bioenergy, fiber for wood supply, and carbon storage. These crops can also be used to remediate brownfields,

reduce agricultural runoff to streams, and improve water quality.

FIRE RESEARCH IN WISCONSIN SUPPORTS THE NATIONAL FIRE PLAN.

The Station expects to receive additional research funds to support the National Fire Plan in FY 2005. The Rhinelander Field Office will receive \$168,000.

- Atmospheric, environmental, and social factors all play critical roles in the efficient implementation of hazardous fuels reduction projects. Station researchers are working hand-in-hand with managers in the Region to help them meet their fuel reduction targets by developing new products and accelerating their delivery. A novel effort underway at the Station involves taking the latest research tools and technologies "on the road" to deliver and demonstrate them in person and interactively with Regional staff.

FY 2005 PROGRAM CHANGES:

- The FY 2005 President's Budget directs increased spending on three priority research areas: Invasive species, watershed, and science application technology. It also includes increases for fixed costs.
- FS R&D continues research at Rhinelander, which has:
 - Determined the environmental effects and economic sustainability of short-rotation woody crops grown for biobased industries and bioenergy potential in the Midwest.
 - Enhanced land managers' ability to anticipate the effects of landscape changes on water quality, wildlife habitat, fire management options and forest productivity.

- Forest Service Research and Development will lead an Agency-wide effort to optimize the delivery and practical use of research findings. This is essential to successful implementation of Forest Service priorities, including the President's Healthy Forest Initiative. Opportunities have been identified that leverage current science and technology applications efforts in healthy forests applied science, watershed management, invasive species, hazardous fuels utilization and management, and community preparedness. New funds in FY 2005 will be targeted to leading-edge technical assistance on a competitive basis.

SIGNIFICANT RESEARCH PRODUCTS:

Work continues at Rhinelander toward developing and delivering the following products:

- Models of forest growth dynamics that are proving valuable for simulating the consequences of harvesting and natural disturbance.
- New options for intensively managed tree crops that offer Midwestern farmers alternative uses for excess cropland and create a source of biomass for energy production and additional carbon storage in soils.
- More realistic forecasts of the impacts of future climate on forests in the Lake States to help resource managers plan appropriate management strategies for forests growing in a high carbon dioxide, high ozone atmosphere.
- New computer models incorporating human development and forest management practices, which can then be used to predict the likelihood of spruce budworm outbreaks.

- New fast growing hybrid poplar and willow clones that can take up toxic releases from landfills, stabilize eroding stream banks, reduce agricultural runoff from croplands, and restore brownfields.

SOME CLIENTS/COLLABORATORS:

Champion International Corporation
 Chequamegon-Nicolet, Ottawa, and
 Huron-Manistee National Forests
 College of Menominee Nation
 Department of Energy, Biofuels
 Feedstock Development Program
 Department of Energy, Office of Science
 Great Lakes Indian Fish and Wildlife
 Commission
 Iowa State University
 Oak Ridge National Laboratory
 University of Minnesot - Duluth
 University of Minnesota
 University of Wisconsin, Stevens Point
 University of Wisconsin